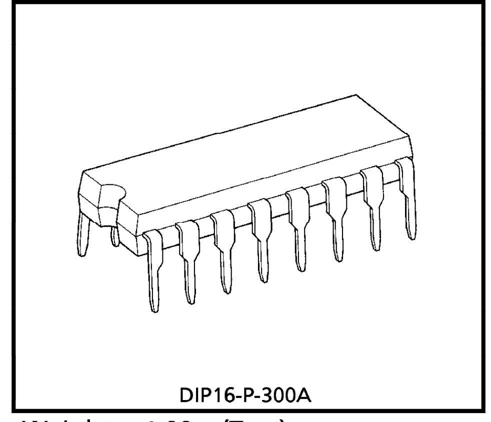
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT

TA7784P

SILICON MONOLITHIC

DUAL PREAMPLIFIER FOR AUTOREVERSE

The TA7784P is dual preamplifier for autoreverse type and W-cassette type tape player.
This IC contains dual preamplifier, forward / reverse control switches and metal / normal tape equalizer control switches.



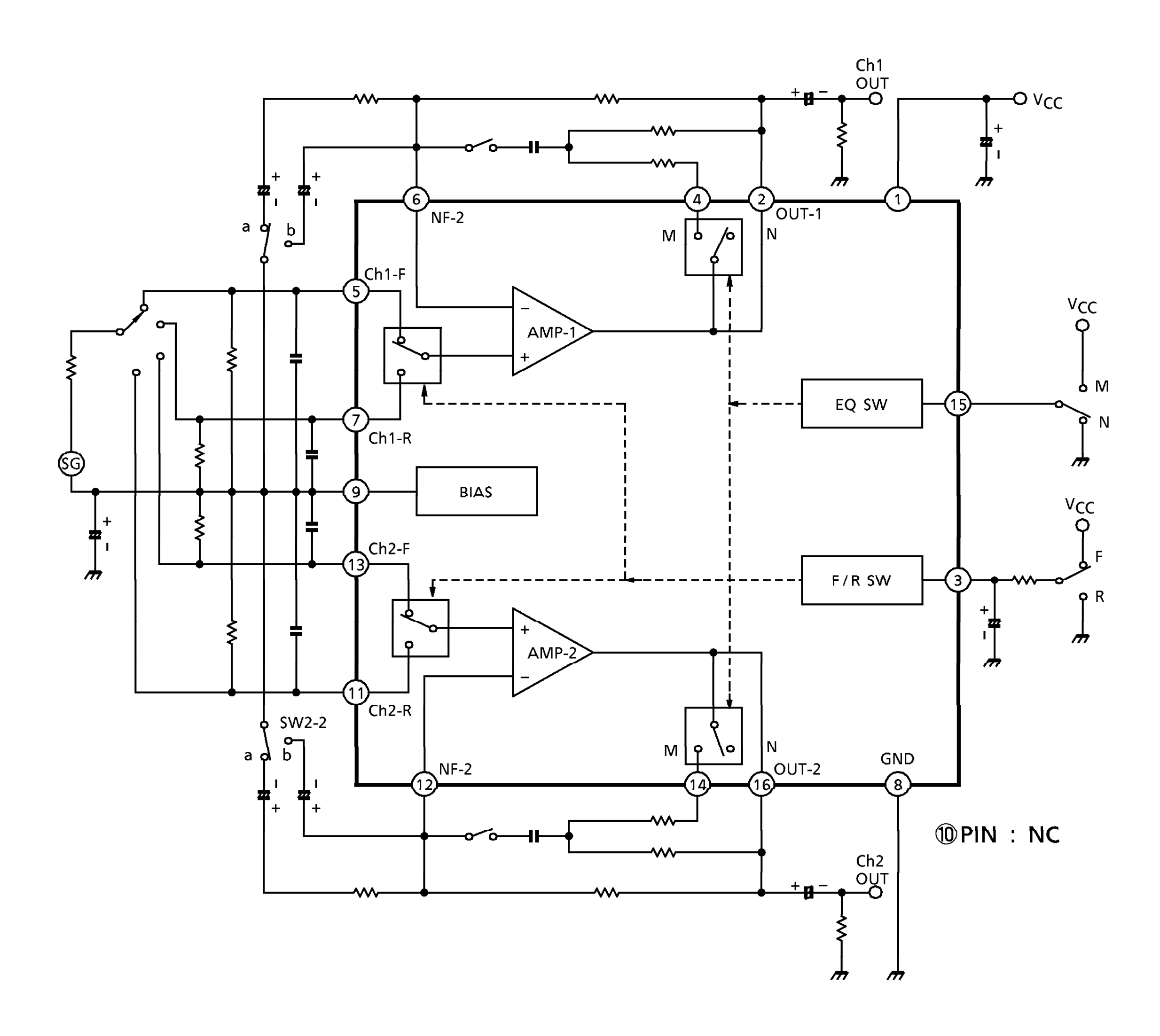
DIP16-P-300A

Weight : 1.00g (Typ.)

FEATURES

- Built-in Forward / Reverse (TAPE1 / TAPE2) Control Switches.
- Built-in Metal / Normal Tape Equalizer Control Switches.
- High Voltage Gain
  : G_{VO} = 95dB (Typ.) (V_{CC} = 6V, f = 1kHz)
- Operating Supply Voltage Range
  : $V_{CC\,(opr)}$ = 3.5~15V (Ta = 25°C)
- Input Coupling Capacitor Less
- Low Noise (Equivalent Input Noise Voltage)
  : $V_{ni} = 1.0\mu V_{rms}$ (Typ.)
  ($R_g = 600\Omega$, BW = 20~20kHz, NAB EQ)

BLOCK DIAGRAM



APPLICATION INFORMATION

(1) Forward / reverse select switch

① Threshold voltage

Pin③ is coupled to the base of Q1 (PNP-Tr) as shown Fig.1.
Threshold voltage

REVERSE	0~0.3V
FORWARD	1.1~V_{CC}

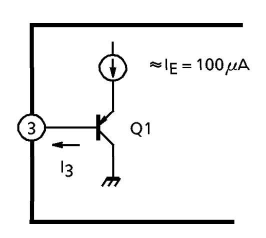


Fig.1

② The recommended forward / reverse select circuit is shown in Fig.2.

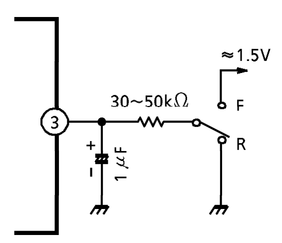


Fig.2

③ I_3 (In Fig.1)

I_3 = 12μA (Max.) (Ta = 25°C)

(2) Equalizer control switch

Pin⑮ is coupled to the base of Q2 (PNP-Tr) as shown Fig.3.
The emitter potential of Q2 is 2.6Vdc.
Threshold voltage



METAL	2.1~V_{CC}
NORMAL	0~1.2V

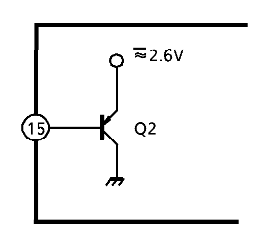


Fig.3

(3) C2~C5

Capacitor C2~C5 may be required for preventing a instability caused by the pattern layout or interference of external high frequency signal.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	16	V
Power Dissipation	P_D (Note)	750	mW
Operating Temperature	T_{opr}	−30~75	°C
Storage Temperature	T_{stg}	−55~150	°C

(Note) Derated above Ta = 25°C in the proportion of 6mW / °C.

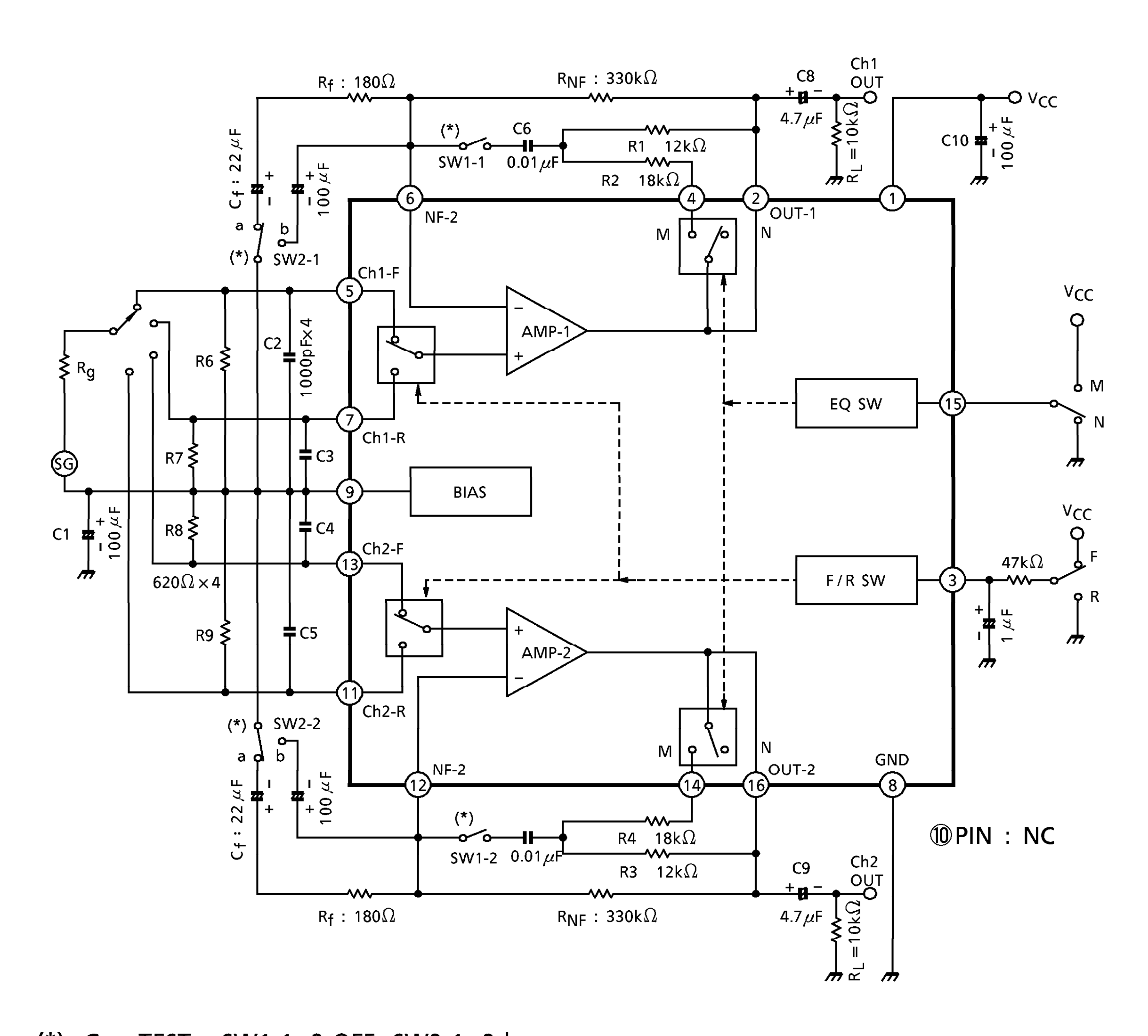
ELECTRICAL CHARACTERISTICS
(Unless otherwise specified, V_{CC} = 6V, f = 1kHz, R_L = 10kΩ, R_g = 600Ω, Ta = 25°C, metal EQ)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CCQ} (1)	—	V_{in} = 0, NORMAL EQ	—	5.5	—	mA
	I_{CCQ} (2)	—	V_{in} = 0, METAL EQ	—	7.0	11	
Open Loop Voltage Gain	G_{vo}	—	C_f = 100μF, R_f = 0	—	95	—	dB
Maximum Output Voltage	V_{om}	—	THD = 0.5%	1.1	1.5	—	V_{rms}
Total Harmonic Distortion	THD	—	V_{out} = 0.5V_{rms}	—	0.035	0.12	%
Equivalent Input Noise Voltage	V_{in}	—	R_g = 620Ω, NAB BW = 20Hz~20kHz, Nor. EQ	—	1.0	1.7	μV_{rms}
Ripple Rejection	R.R.	—	f_{ripple} = 100Hz, V_{in} = 1V_{rms}	—	55	—	dB
Cross Talk	C.T.	—	V_{out} = 0.775V_{rms} (0dBm)	50	60	—	dB
Forward / Reverse Cross Talk	C.T. (F / R)	—	V_{out} = 0.775V_{rms} (0dBm)	60	70	—	dB

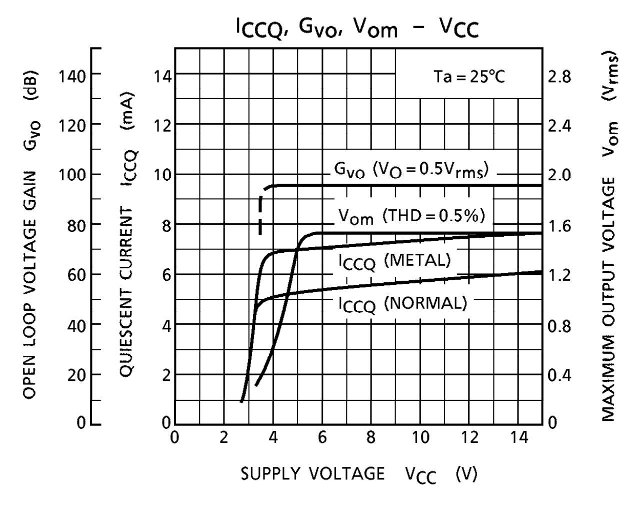
TYPICAL DC VOLTAGE OF EACH TERMINAL (V_{CC} = 6V, Ta = 25°C, dual mode test circuit)

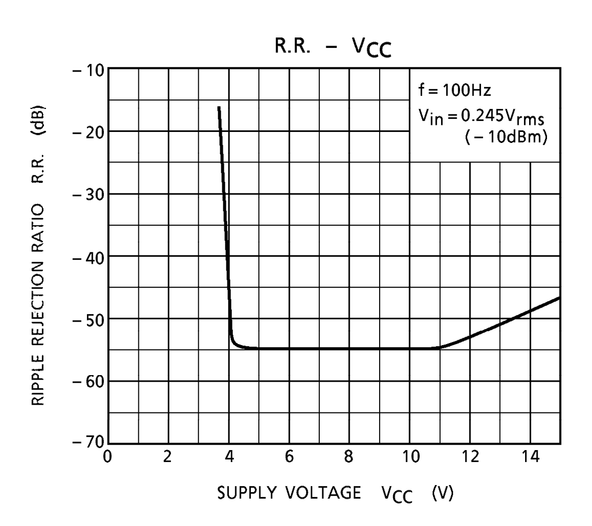
TERMINAL No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DC-VOLTAGE (V)	V_{CC}	2.3	V_{CC} / GND	2.2	2.2	2.2	2.2	GND	2.2	NC	2.2	2.2	2.2	2.2	V_{CC} / GND	2.2

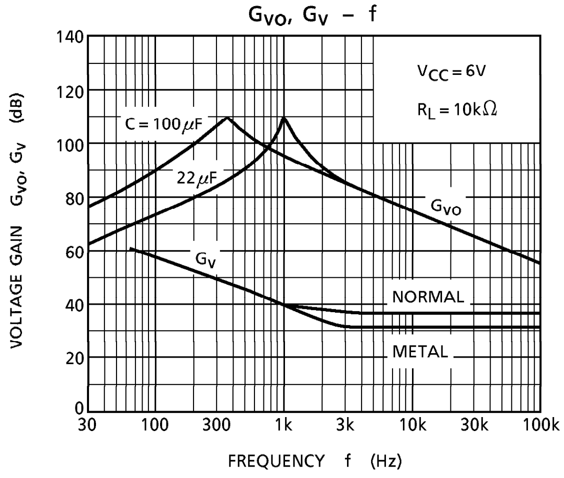
TEST CIRCUIT

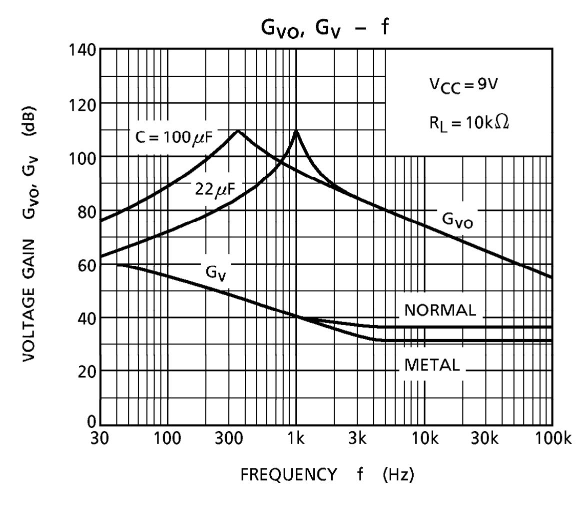


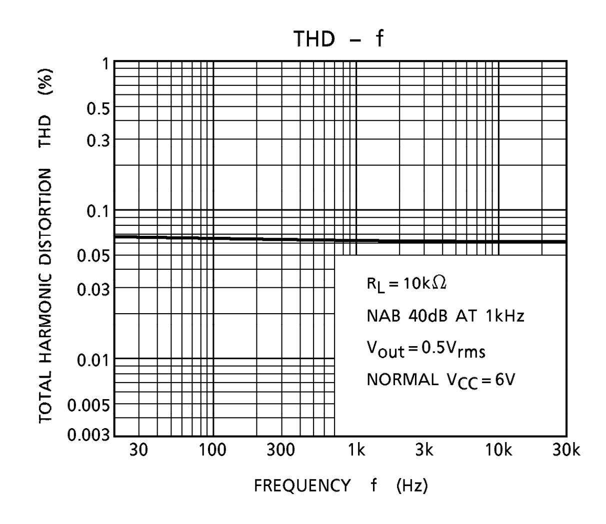
(*) G_{VO} TEST : SW1-1, 2-OFF, SW2-1, 2-b

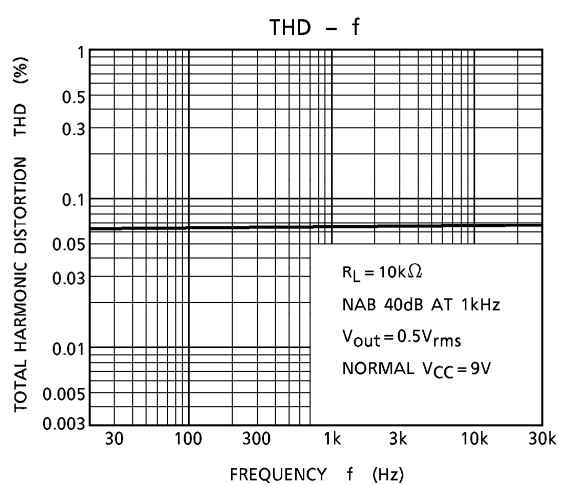

I_{CCQ}, G_{vo}, V_{om} – V_{CC}
Ta = 25°C
G_{vo} (V_O = 0.5V_{rms})
V_{om} (THD = 0.5%)
I_{CCQ} (METAL)
I_{CCQ} (NORMAL)
OPEN LOOP VOLTAGE GAIN G_{vo} (dB)
QUIESCENT CURRENT I_{CCQ} (mA)
MAXIMUM OUTPUT VOLTAGE V_{om} (V_{rms})
SUPPLY VOLTAGE V_{CC} (V)

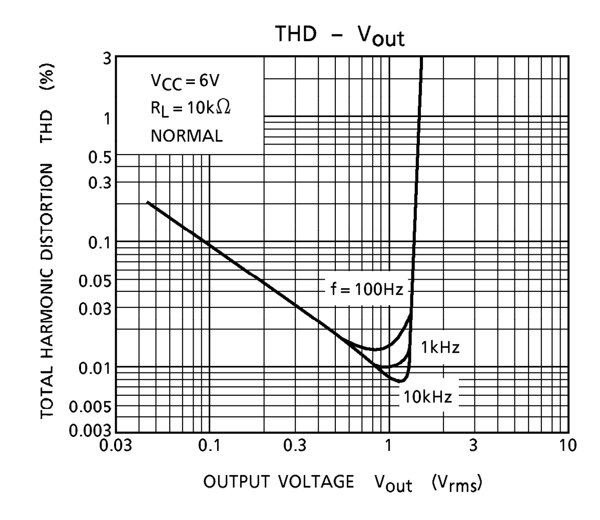

R.R. – V_{CC}
f = 100Hz
V_{in} = 0.245V_{rms}
(–10dBm)
RIPPLE REJECTION RATIO R.R. (dB)
SUPPLY VOLTAGE V_{CC} (V)

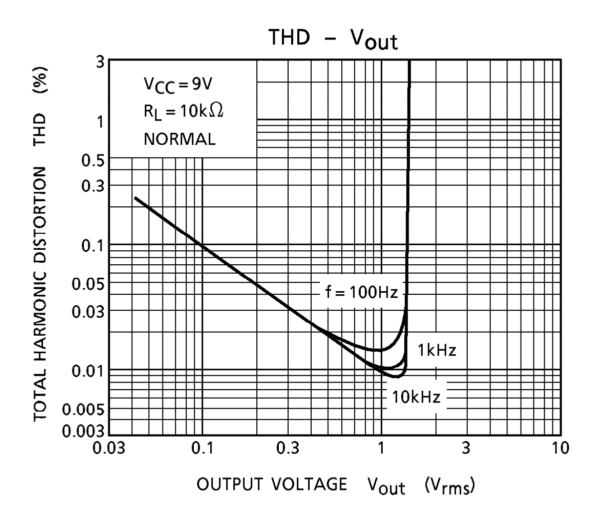

G_{VO}, G_V – f
V_{CC} = 6V
R_L = 10kΩ
C = 100μF
22μF
G_{VO}
G_V
NORMAL
METAL
VOLTAGE GAIN G_{VO}, G_V (dB)
FREQUENCY f (Hz)

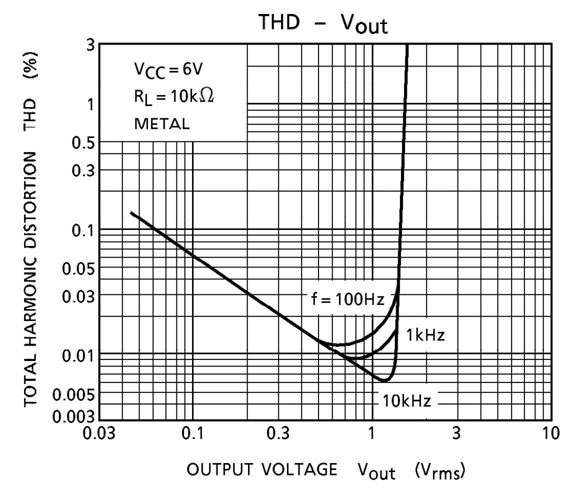

G_{VO}, G_V – f
V_{CC} = 9V
R_L = 10kΩ
C = 100μF
22μF
G_{VO}
G_V
NORMAL
METAL
VOLTAGE GAIN G_{VO}, G_V (dB)
FREQUENCY f (Hz)

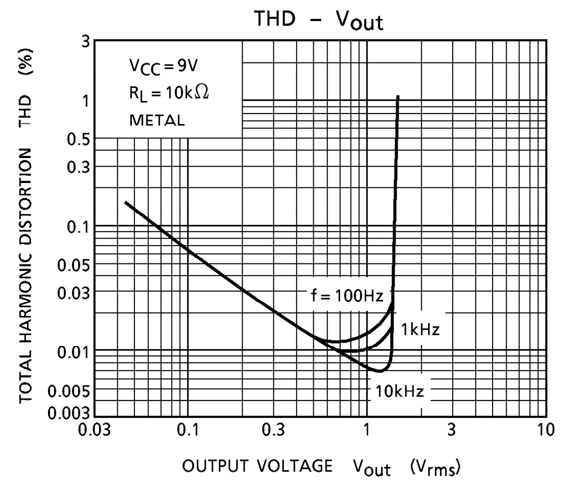

THD – f
R_L = 10kΩ
NAB 40dB AT 1kHz
V_{out} = 0.5V_{rms}
NORMAL V_{CC} = 6V
TOTAL HARMONIC DISTORTION THD (%)
FREQUENCY f (Hz)

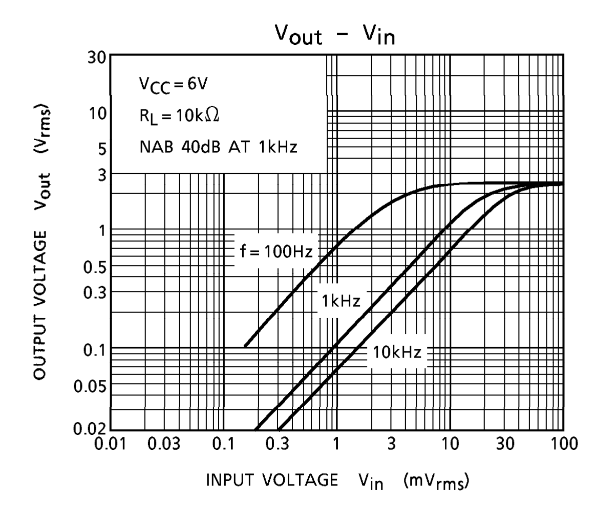

THD – f
R_L = 10kΩ
NAB 40dB AT 1kHz
V_{out} = 0.5V_{rms}
NORMAL V_{CC} = 9V
TOTAL HARMONIC DISTORTION THD (%)
FREQUENCY f (Hz)

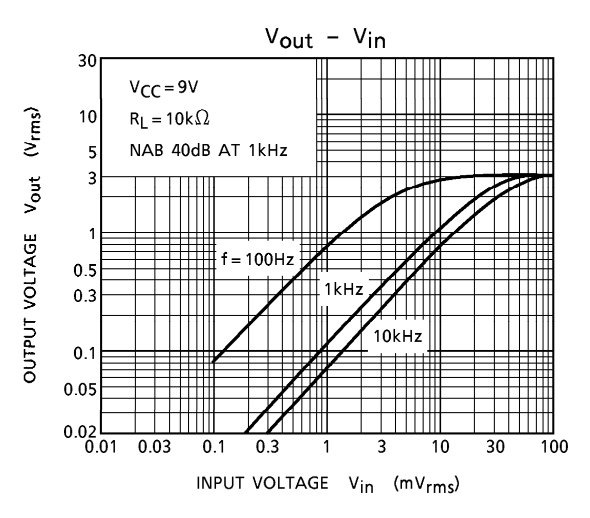

THD – Vout
VCC = 6V
RL = 10kΩ
NORMAL
f = 100Hz
1kHz
10kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT VOLTAGE Vout (Vrms)

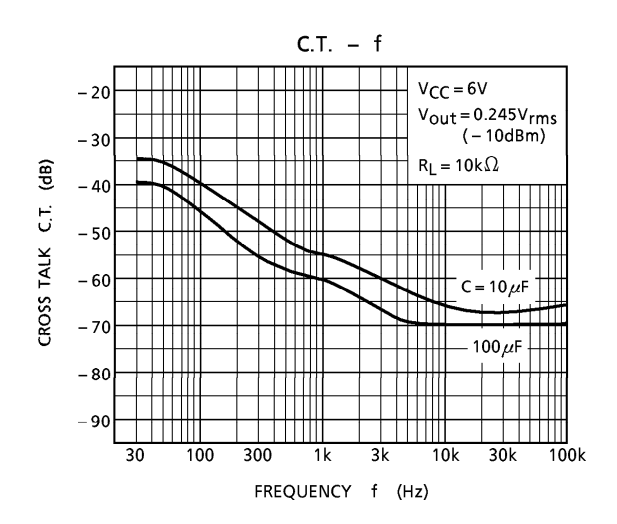

THD – Vout
VCC = 9V
RL = 10kΩ
NORMAL
f = 100Hz
1kHz
10kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT VOLTAGE Vout (Vrms)

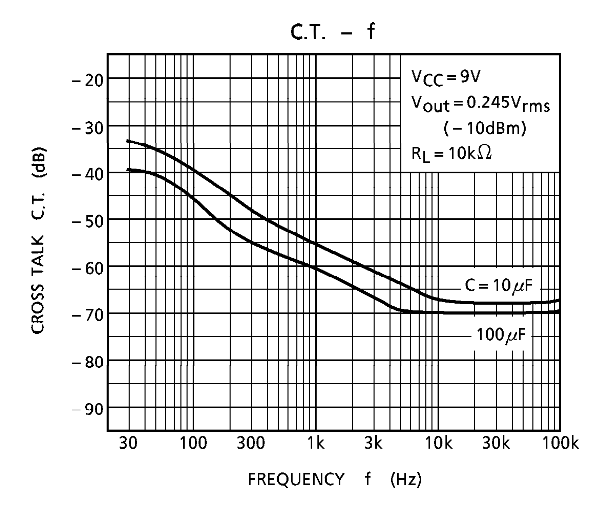

THD – Vout
VCC = 6V
RL = 10kΩ
METAL
f = 100Hz
1kHz
10kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT VOLTAGE Vout (Vrms)

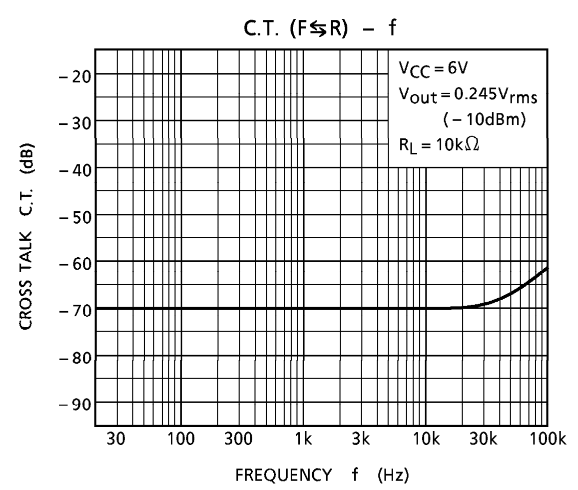

THD – Vout
VCC = 9V
RL = 10kΩ
METAL
f = 100Hz
1kHz
10kHz
TOTAL HARMONIC DISTORTION THD (%)
OUTPUT VOLTAGE Vout (Vrms)

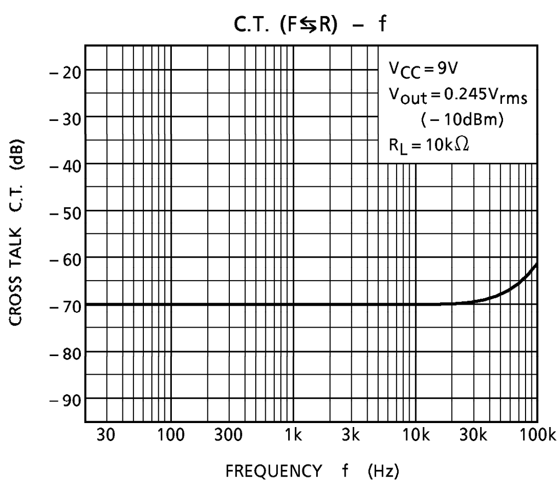

Vout – Vin
VCC = 6V
RL = 10kΩ
NAB 40dB AT 1kHz
f = 100Hz
1kHz
10kHz
OUTPUT VOLTAGE Vout (Vrms)
INPUT VOLTAGE Vin (mVrms)

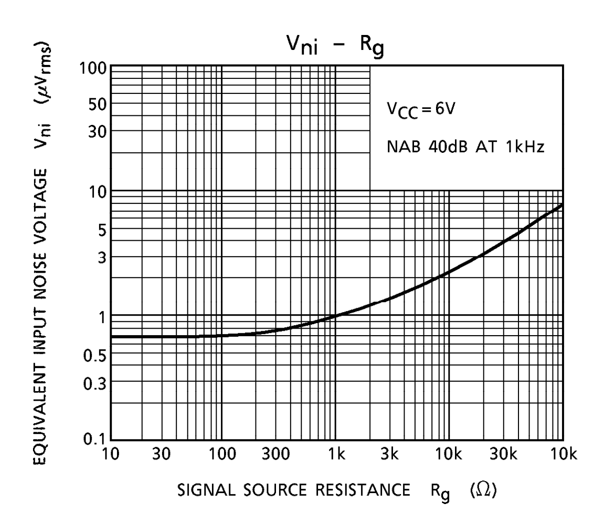

Vout – Vin
VCC = 9V
RL = 10kΩ
NAB 40dB AT 1kHz
f = 100Hz
1kHz
10kHz
OUTPUT VOLTAGE Vout (Vrms)
INPUT VOLTAGE Vin (mVrms)

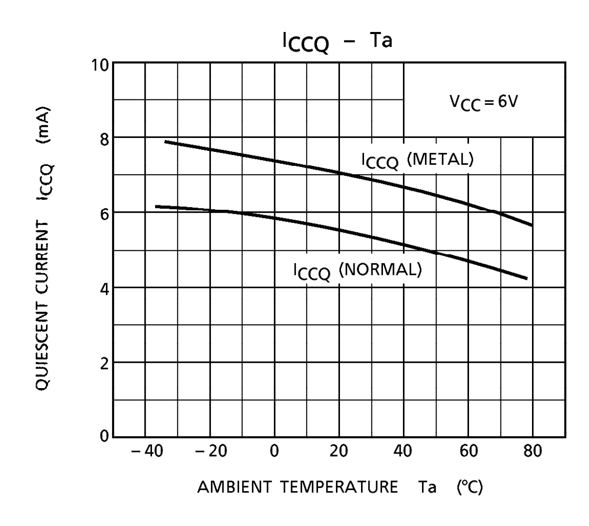

C.T. – f
VCC = 6V
Vout = 0.245Vrms (– 10dBm)
RL = 10kΩ
C = 10μF
100μF
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)

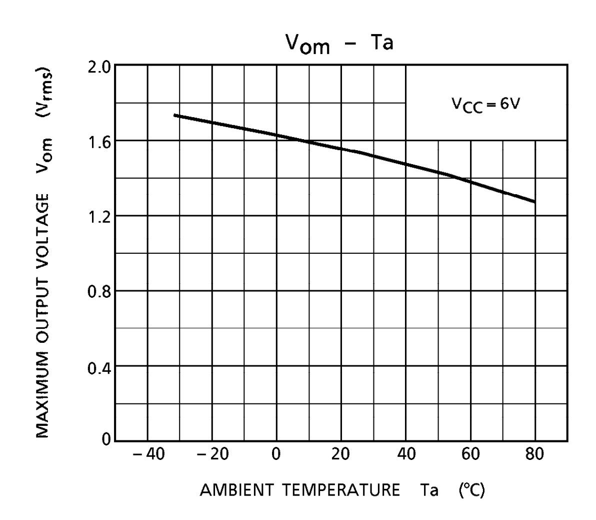

C.T. – f
VCC = 9V
Vout = 0.245Vrms (– 10dBm)
RL = 10kΩ
C = 10μF
100μF
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)

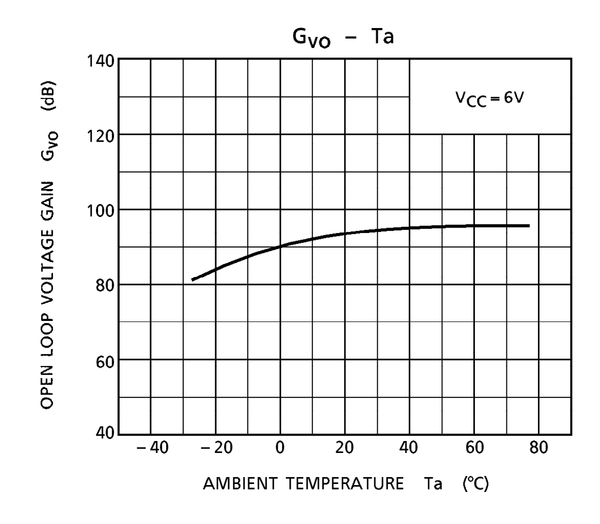

C.T. (F⇆R) – f
VCC = 6V
Vout = 0.245Vrms (– 10dBm)
RL = 10kΩ
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)


C.T. (F⇆R) – f
VCC = 9V
Vout = 0.245Vrms (– 10dBm)
RL = 10kΩ
CROSS TALK C.T. (dB)
FREQUENCY f (Hz)

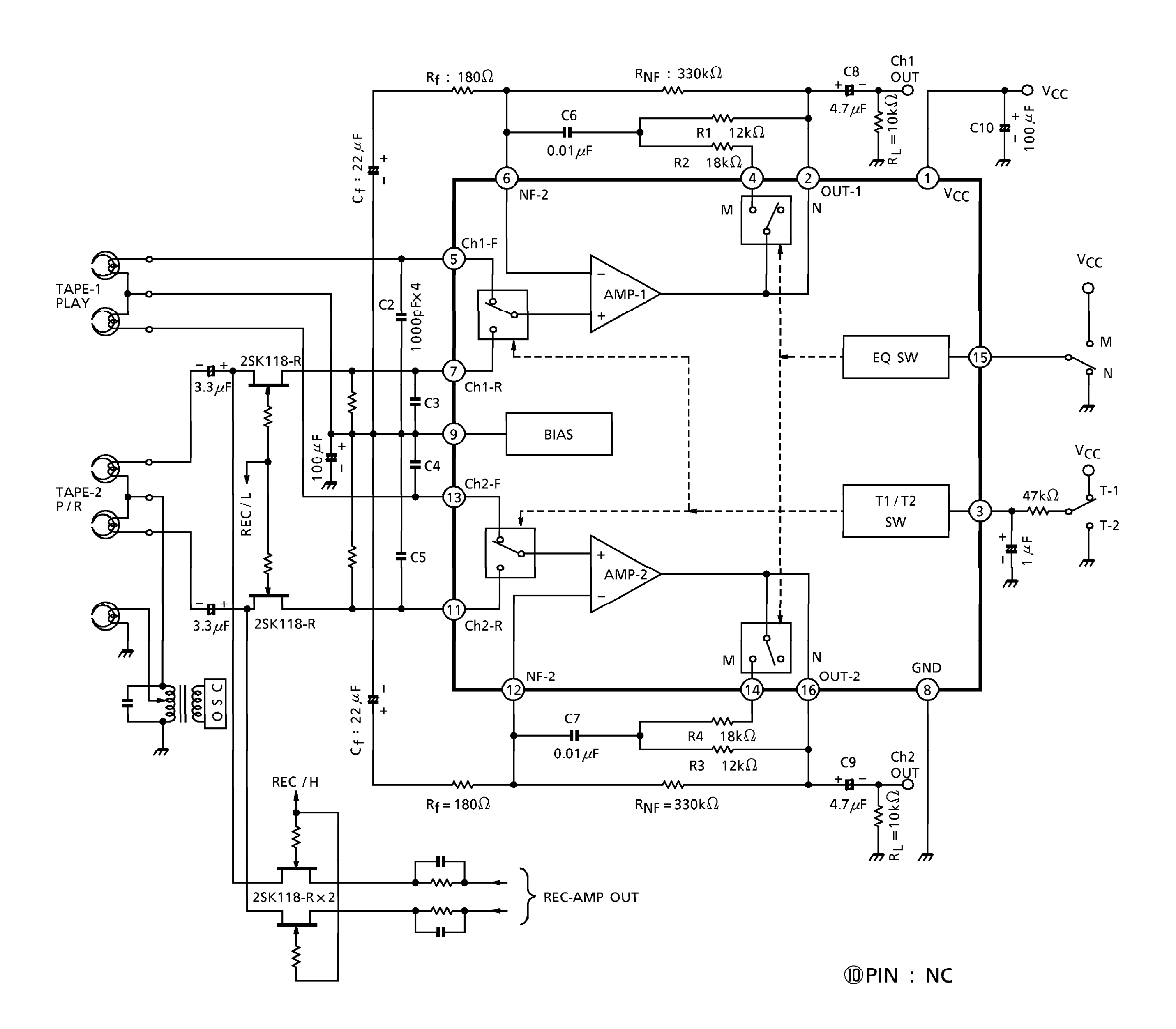

Vni – Rg
VCC = 6V
NAB 40dB AT 1kHz
EQUIVALENT INPUT NOISE VOLTAGE Vni (μVrms)
SIGNAL SOURCE RESISTANCE Rg (Ω)


ICCQ – Ta
VCC = 6V
ICCQ (METAL)
ICCQ (NORMAL)
QUIESCENT CURRENT ICCQ (mA)
AMBIENT TEMPERATURE Ta (°C)


V_{om} – Ta
V_{CC} = 6V
MAXIMUM OUTPUT VOLTAGE V_{om} (V_{rms})
2.0
1.6
1.2
0.8
0.4
0
– 40
– 20
0
20
40
60
80
AMBIENT TEMPERATURE Ta (°C)

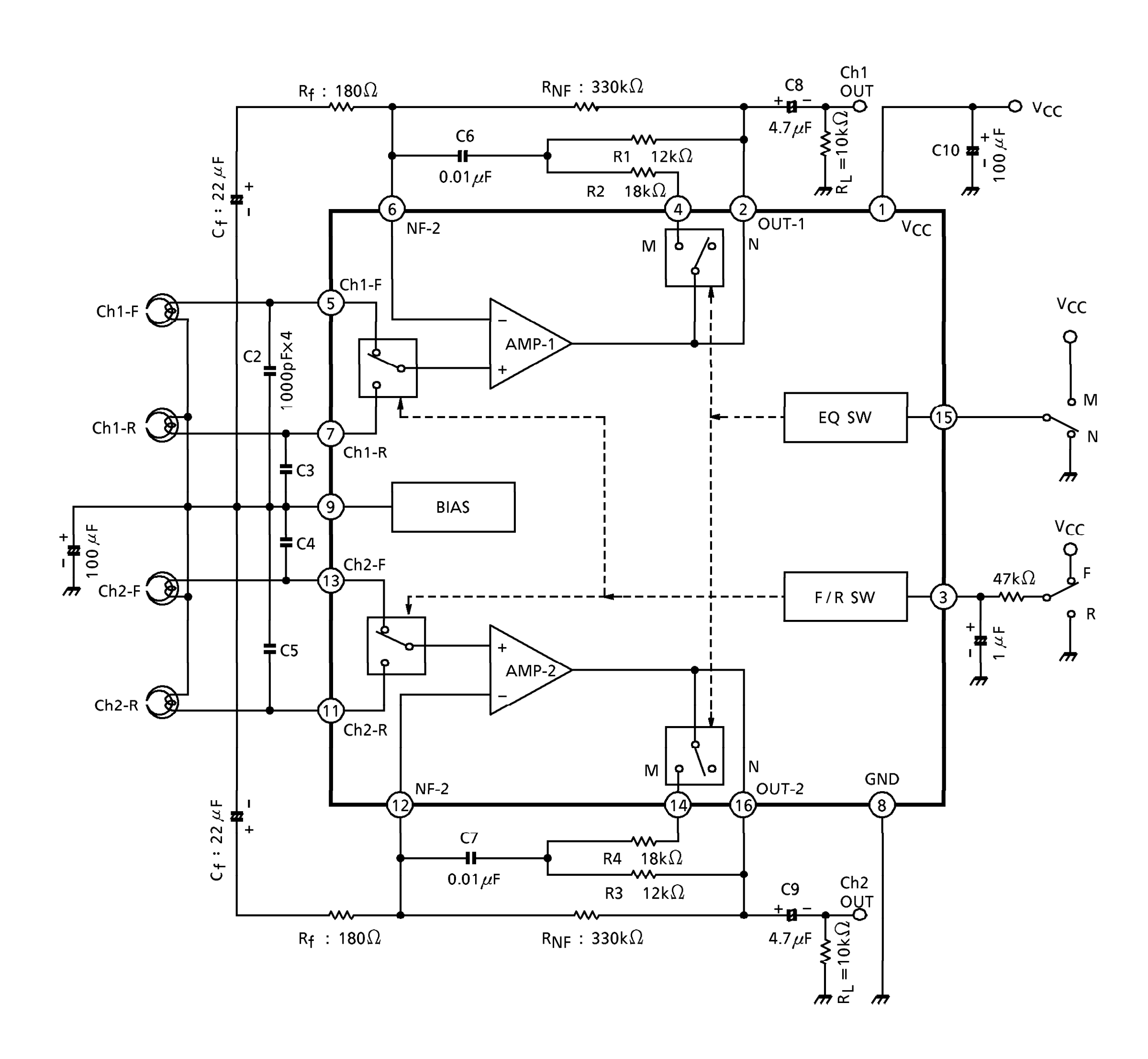

G_{VO} – Ta
V_{CC} = 6V
OPEN LOOP VOLTAGE GAIN G_{VO} (dB)
140
120
100
80
60
40
– 40
– 20
0
20
40
60
80
AMBIENT TEMPERATURE Ta (°C)

APPLICATION 1 (Double cassette player)



⑩PIN : NC

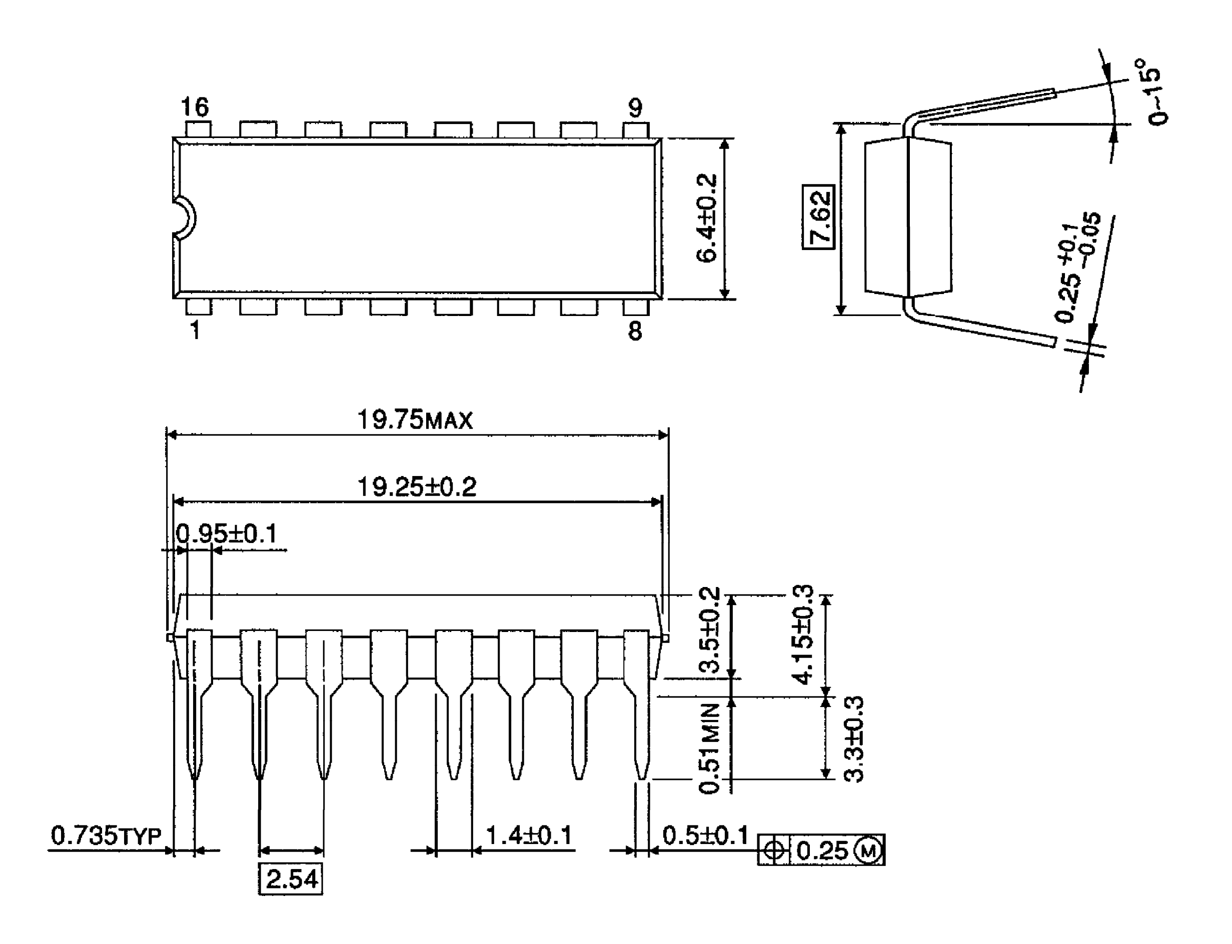
APPLICATION 2 (Autoreverse)



⑩PIN : NC

OUTLINE DRAWING
DIP16-P-300A

Unit : mm



Weight : 1.00g (Typ.)